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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,632	09/15/2003	Chung-Sam Jun	253/033	7928
27849	7590	10/22/2007		
LEE & MORSE, P.C. 3141 FAIRVIEW PARK DRIVE SUITE 500 FALLS CHURCH, VA 22042			EXAMINER PATEL, JAYESH A	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 10/22/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/661,632	Applicant(s) JUN ET AL.	
	Examiner Jayesh A. Patel	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 18-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7,9-12 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Russell (US 6731824) hereafter Russell.

1. Regarding Claim 1, Russell discloses a method for analyzing a sample (**Figs 1A and 1B, Col 4 Lines 9 through Col 5 Lines 64**) by employing a Fast Fourier Transformation method, comprising: generating an image of a region of the sample to be analyzed (**Fig 1A step 100, Col 4 Lines 22-27**); generating data having a frequency from a plurality of portions of the image by the Fast Fourier Transformation method (**Fig 1A step 110, Col 4 Lines 28-36**); and analyzing the generated data from the plurality of portions to determine whether the region is normal or abnormal without using a separate reference sample (**Fig 1A,1B steps 120-180 and Col 4 Lines 37 through Col 5 Lines 64**). Russell discloses a quick method for detecting irregularities in SEM images having periodic patterns as shown in Fig 6.

2. Regarding Claim 2, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as claimed in claim 1, wherein the region includes a periodically formed pattern as shown in Fig 2 and 6.

3. Regarding Claim 3, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as claimed in claim 1, wherein the region is formed on a semiconductor substrate and corresponds to a cell region (**many single regular circuit structures forming a cell**) including a periodic pattern in (**Figs 2,6 and Col 5 Lines 63-64**).

4. Regarding Claim 4, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as Claimed in claim 3, wherein the periodic pattern has a line width (**edges of the single regular circuit structure in fig 2**) and is formed by an etching process.

5. Regarding Claim 5, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as claimed in claim 1, wherein the image is generated by a scanning electron microscope in (**Fig 1A step 100 and Col 4 Lines 22-27**).

6. Regarding Claim 6, Russell discloses the method for analyzing a sample by

employing a Fast Fourier transformation method as claimed in claim 1, further comprising defining the image into at least two pixel units as in **(Figs 2, 5A, 5B and 6)**. The two-dimensional (2-D) pixel data of the image consists of pluralities of pixels **(Col 4 Lines 25-26)**.

7. Regarding Claim 7, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as claimed in claim 1, further comprising providing an alarm **(automatically switching from regular display to the resulting visualized image with defects)** when the region is abnormal at **(Col 5 Lines 50-64)**. Russell discloses automatically switching of the display from original to the defect image display indicates displaying the alarm condition.

8. Claim 9 is a corresponding apparatus Claim of the Claim 1. See the explanation of Claim 1.

9. Regarding Claim 10 see the explanation of Claim 5.

10. Regarding Claim 11 see the explanation of Claim 1 and **(Col 5 Lines 50-53)**.

11. Regarding Claim 12, see the explanation of Claim 7.

12. Regarding Claim 18, Russell discloses the method for analyzing a sample by employing a Fast Fourier Transformation method as claimed in claim 1, wherein analyzing the generated data includes using solely the data generated from the image as in **(figs 1A and 1B)**. Russell filters and masks the original image in order to detect the irregularities.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8,13,19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell in view of Kane et al. (US 6326618) hereafter Kane

13. Regarding Claim 8, Russell discloses a method for analyzing a sample **(Figs 1A and 1B, Col 4 Lines 9 through Col 5 Lines 64)** by employing a Fast Fourier Transformation method, comprising; generating data having a frequency from a plurality of portions of the image by the Fast Fourier Transformation method **(Fig 1A step 110, Col 4 Lines 28-36)**; and analyzing the generated data from the plurality of portions to determine whether the minute pattern is normal or abnormal without using a separate reference sample **(Fig 1A,1B steps 120-180**

and Col 4 Lines 37 through Col 5 Lines 64). Russell discloses a quick method for detecting irregularities in SEM images having periodic patterns as shown in Fig 6. Russell also discloses generating an image of a region of the sample to be analyzed (**Fig 1A step 100, Col 4 Lines 22-27**), however is silent and does not disclose generating a magnified image of a minute pattern formed in a cell region of a semiconductor substrate and measuring a line width of the minute pattern using the magnified image.

Kane discloses generating a magnified image (**magnification controller 138 Fig 2C**) of a minute pattern formed in a cell region of a semiconductor substrate and measuring a line width of the minute pattern using the magnified image at (**Col 4 Lines 39-67, Col 5 Lines 1-40 and Col 6 Lines 50-55**). Kane further disclose that a well tuned (**using magnification control 138**) SEM produced a 276 nanometer line width while an untuned SEM produced a line width of 283 nanometers and thus providing the width accuracy in the nanometer ranges, critical in the semiconductor industry at (**Col 5 lines 3-12**). Both Russell and Kane are from the same field of endeavor and are analogous art, therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the teachings of Kane in the apparatus and method of Russell for the above reasons.

14. Claim 13 is an apparatus Claim of claim 8. See the explanation of claim 8.

15. Regarding Claim 19 see the explanation of Claim 8. Russell further discloses that the present invention provides a quick approximately 2-3 seconds method and apparatus for detecting the irregularities at **(Col 5 Lines 62-64)**. This shows that the measurement for the line width (edges) and displaying is done simultaneously.

16. Regarding Claim 20 see the explanation of Claim 13 and the **(magnification control unit 138 Fig 2C)** in Kane. Russell also discloses a SEM being automatic and fine-tunable **(providing focused and magnified image)** at **(Col 2 Line 48)**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayesh A. Patel whose telephone number is 571-270-1227. The examiner can normally be reached on M-F 7.00am to 4.30 pm (5-4-9). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public

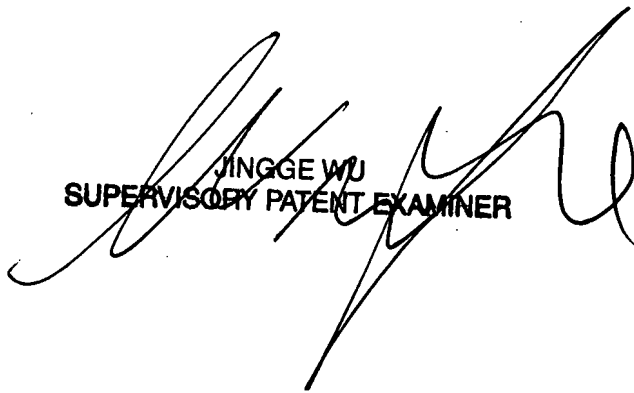
Art Unit: 2624

PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jayesh Patel
10/17/07

JP

JINGGE WU
SUPERVISORY PATENT EXAMINER

A large, stylized handwritten signature in black ink, likely belonging to Jingge Wu, is written over the printed name and title.